

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

TITLE V PERMIT NO. V-03-005 REVISION 2

BEREA COLLEGE

RUSTIC ROAD CPO 2337, BERE, KENTUCKY

OCTOBER 21, 2005

MARTHA ALLMAN, REVIEWER

SOURCE I.D. #: 021-151-00006

SOURCE A.I. #: 39053

ACTIVITY #: APE20050004

**SOURCE DESCRIPTION**

On May 23, 2005, the Division received an application from Berea College for a minor modification to its Title V permit. Berea College is a liberal arts college located in Madison County, Kentucky. In the past, Berea College has operated both coal and natural gas boilers to provide heating to classrooms and other campus facilities. Its air permit also includes a Wood Surface Coating Operation.

The first permit revision was issued on February 10, 2005 for the construction of a 50 mmBtu/hr natural gas boiler, Emission Unit 5, to replace two coal-fired units, Emission Units 1 and 2. Emission Unit 2 has been the subject of previous enforcement actions. Emission Unit 1 has not operated since 2001 and would require extensive repairs to become operational. Per the terms of an Agreed Order, DAQ-04027, filed on June 6, 2005, Berea College agreed not to operate Emission Unit 02. The Agreed Order was subsequently amended on July 28, 2005 to include Emission Unit 01. Berea College is leasing the 50 mmBtu/hr boiler temporarily pending the development of a long term solution.

The current application is for the construction of six natural gas boilers, two 6.25 mmBtu/hr boilers, two 18 mmBtu/hr boilers, a 1.76 mmBtu/hr boiler and a 0.75 mmBtu/hr boiler. The two 18 mmBtu/hr boilers will have the ability to burn fuel oil as a back-up fuel. Berea College proposes the use of No. 2 low sulfur distillate fuel oil, which is 0.05 percent sulfur, to ensure compliance with sulfur dioxide limitations. The two 18 mmBtu/hr boilers will be used as centralized heating sources, while the smaller boilers will be distributed on campus to meet localized needs.

The 0.75 mmBtu/hr boiler meets the criteria for an insignificant activity as defined by 401 KAR 52:020, Section 6. In accordance with 40 CFR 52.21 and 401 KAR 51:017, the maximum potential emissions for all regulated pollutants from the proposed units were calculated based on 8760 hours per year. Based on the evaluation, maximum potential emissions of particulate matter, SO<sub>2</sub> and NO<sub>x</sub> are below the significant emissions rate as defined in 401 KAR 51:001, Section 1(222)(a), and there are no hazardous air pollutant emissions from the units. Therefore, the addition of the boilers does not trigger a prevention of significant deterioration review for the facility, nor is it a significant

### **APPLICABLE REGULATIONS**

401 KAR 59:015, New Indirect Heat Exchangers, which is applicable to indirect heat exchangers with a capacity over 1 mmBtu but less than 250 mmBtu/hour, constructed after April 9, 1972.

401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, which is applicable to steam generating units with a capacity greater than 10 mmBtu but less than 100 mmBtu/hr, constructed after June 9, 1989.

### **DESCRIPTION OF NEW EQUIPMENT AND APPLICABLE PERMIT REQUIREMENTS**

#### **Emission Units 06-01 and 06-02 – Two 6.25 mmBtu/hr boilers**

#### **Emission Unit 07-01 - One 1.26 mmBtu/hr boiler**

The new boilers will use natural gas to provide steam for the campus heating system. The units can potentially operate 8760 hours per year.

Pursuant to 401 KAR 59:015 Section 4(1) and Section 5(1), the units shall have emissions of particulate matter (PM)  $\leq 0.295$  lbs/mmBtu, each and that of sulfur dioxide (SO<sub>2</sub>)  $\leq 0.98$  lbs/mmBtu, each.

Pursuant to 401 KAR 59:015, Section 4(1), for indirect heat exchangers with heat input capacity of less than 250 million Btu per hour, opacity shall not exceed 20 percent. A maximum of 40 percent opacity shall be permissible for not more than 6 consecutive minutes in any 60 consecutive minutes while cleaning the firebox or blowing soot. There is no limit while building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturers recommendations.

Compliance Demonstration: The units are in compliance with PM and SO<sub>2</sub> while burning natural gas.

#### **Emission Units 08-01 and 8-02 - Two 18 mmBtu/hr boilers**

The two new 18 mmBtu/hr boilers will use natural gas and low sulfur distillate to provide hot water for the campus heating system. The units can potentially operate 8760 hours per year.

Pursuant to 401 KAR 59:015 Section 4(1) and Section 5(1), the units shall have emissions of particulate matter (PM)  $\leq 0.295$  lbs/mmBtu, each and that of sulfur dioxide (SO<sub>2</sub>)  $\leq 0.98$

lbs/mmBtu, each.

Pursuant to 401 KAR 59:015, Section 4(1), for indirect heat exchangers with heat input capacity of less than 250 million Btu per hour, opacity shall not exceed 20 percent. A maximum of 40 percent opacity shall be permissible for not more than 6 consecutive minutes in any 60 consecutive minutes while cleaning the firebox or blowing soot. There is no limit while building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturers recommendations.

Compliance Demonstration: The units are in compliance with PM and SO<sub>2</sub> while burning natural gas or low sulfur distillate oil (ASTM D975 Low Sulfur No. 2-D) with certification from fuel supplier and owner/operator in accordance with 40 CFR 60.44c(h).

#### **COMMENTS**

The two coal-fired units, Emission Units 1 and 2, were not included in total rated heat input capacity when calculating particulate matter and sulfur dioxide limitations for the new boilers. Per 401 KAR 59:015 Section 3(2), the allowable emission rates for existing facilities were not changed due to the inclusion or shutdown of any units.

Emission factors were obtained from AP-42.

#### **CREDIBLE EVIDENCE**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. **At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.**